



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: John Charles Sinclair and Martin Edward Mantyla Noble

Application No.: 10/530,795                      Group: 1656

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Confirmation No.: 9371

For: Protein Lattice

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**REPLY TO RESTRICTION REQUIREMENT**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

The Restriction Requirement, dated July 30, 2007, is being traversed because all of the claims as filed have a single special technical feature that defines a contribution over the prior art. The special technical feature is "a protein lattice having a regular structure with a repeating unit repeating in three dimensions, . . . wherein the repeating unit comprises protomers comprising at least a first monomer which is a monomer of a first oligomer assembly which is symmetrical in three dimensions." (Claim 1) (emphasis added).

The Examiner states that Narayana, *et al.*, *The Dimerization Domain of HNF-1a: Structure and Plasticity of an Interwined Four-Helix Bundle with Application to Diabetes Mellitus*, J. Mol. Bio., 310, 635-658 (2001) (hereinafter "Narayana") contains all the limitations of Claims 1 and 26. Based on this incorrect interpretation of Narayana, the Examiner further states that "the shared technical feature of the groups is not a 'special technical feature', [and] unity of invention between the groups does not exist." (Office Action, page 4)

The restriction requirement is improper because Applicants' invention is not encompassed within the teachings of Narayana, and, therefore, the shared technical feature of the claims is a special technical feature that provides unity of invention. Narayana does not teach all of the limitations of either Claim 1 or Claim 26, as discussed below.

Claim 1 requires a repeating unit "comprising at least a first monomer which is a monomer of a first oligomer assembly which is symmetrical in three dimensions." The protein lattice of the invention requires three dimensional symmetry, and thus can only comprise oligomers with three dimensional symmetry. Such oligomers typically have, for example, tetrahedral, octahedral, or dihedral symmetry. (See PCT, page 10, lines 6-31). In contrast, the protein dimer of Narayana only contains a "2-fold symmetry axis" and thus, does not have three dimensional symmetry. (Narayana, page 638, second column). This conclusion is further evidenced by Figure 1 in Narayana showing the ribbon representation of the dimer – it is clear that the protein only has mirror-image (or 2-D) symmetry and not three dimensional symmetry as required by Applicants' invention. Thus, the teachings of Narayana do not fall within the scope of Claim 1, nor does Narayana anticipate Claim 1.

Claim 26 is directed to "a method of performing x-ray crystallography comprising supporting an array of macromolecular entities on a protein lattice according to Claim 1 and performing x-ray crystallography on the lattice having the macromolecular entities supported thereon." Claim 26 describes a method by which x-ray crystallographic data can be assessed for macromolecular entities without having to independently crystallize the macromolecules themselves. (See PCT, page 24, line 7 through page 25, line 1). Claim 26 does not describe merely performing x-ray crystallography on the protein lattice – rather it describes the "use of the protein lattice as a support in x-ray crystallography." (PCT, page 24, lines 14-15). In contrast, Narayana teaches only x-ray crystallography of the HNF-1 $\alpha$  dimer itself to determine its structure. There are no teachings directed to use of the dimer to support other macromolecules to determine the structure of the macromolecules apart from the structure of the dimer. Thus, the teachings of Narayana do not fall within the scope of Claim 26, nor does Narayana anticipate Claim 26.

In conclusion, Narayana neither teaches nor suggests protein lattices comprising oligomers with three dimensional symmetry, as required in Claim 1. Moreover, it neither teaches nor suggests use of such a protein lattice to support macromolecular entities while

performing x-ray crystallography. Therefore, the special technical feature of Applicants' invention provides a contribution over the prior art, and there is a unity of invention. Because there is a unity of invention, the Examiner's Restriction Requirement is improper and Applicants respectfully request that it be withdrawn.

Responsive to the Restriction Requirement dated July 30, 2007, Applicants elect, with traverse, the claims of Group I (Claims 1-25) drawn to protein lattice having a regular structure with repeating unit repeating in three dimensions. Applicants reserve the right to file a continuing application or take such other appropriate action as deemed necessary to protect the non-elected inventions. Applicants do not hereby abandon or waive any rights in the non-elected inventions.

An extension of time to respond to the Restriction Requirement is respectfully requested. A Petition for an Extension of Time and the appropriate fee are being filed concurrently.

Respectfully submitted,

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